Underwater – Install Galvanic Anodes

1.0 Task Description

This task includes the installation of galvanic anodes on underwater pipeline facilities. This task is similar to Task 9.2 (Install Galvanic Anodes) but contains steps or equipment that are unique to an underwater environment.

2.0 Knowledge Component

The purpose of this task is to provide a galvanic anode to operate with a CP system.

An individual performing this task must have knowledge of the following.

- CP systems and components comparable to AMPP Certification Level CP 2.
- Connection methods (connections are made in a test station with a lead connected to the structure being protected and across a shunt for measurement and testing; isolation of galvanic anodes may be necessary for additional testing of the structure)
- Galvanic anodes and their applications (galvanic anodes may be used for direct CP, shielding of electrical interference, spot protection, or AC mitigation; applications may be in various soil conditions, underwater or offshore, or where power for implied systems is unavailable).
- Types of anodes used in underwater applications (e.g. bracelet, sled, and platform)

Terms applicable to this task are as follows.

AOCs associated with the performance of this task include:

AOC Recognition	AOC Reaction
Indications of a leak (bubbles, globules of oil, oil slick, or rainbow sheen).	Stop all activity related to this task and notify operator personnel, as required.

3.0 Skill Component

To demonstrate proficiency of this task, an individual must perform the following steps:

Step	Action	Explanation
1	Determine the type of anode, location, and installation method to be used.	Bracelet, sled, and weld-on anodes are typically made from materials such as aluminum, zinc, and magnesium. They are installed by a mechanical or welding methods.
2	Install anode(s) according to manufacturer's instructions.	Prepare the area and install the anode. Bracelet anodes are two halves connected around the structure or pipeline. Sled anodes are located on the sea bottom next to the structure or pipeline.
3	Attach bonding strap, pigtail, or cable to achieve electrical continuity.	Achieve electrical continuity by a bonding strap, contact bolt, or wet welding.
4	Perform a post-installation inspection.	Visual/Tactile inspection to check connections for gaps and adequate number of nuts. Verify electrical continuity.
5	Take proximity and/or contact readings and record readings.	Place the probe a few inches to a few feet away from the structure or pipeline for proximity readings. Place the tip of the contact probe on the surface of the structure or pipeline for contact readings. Readings should be reviewed as they are taken to ensure that measurements

Step	Action	Explanation
		fall within the desired range with the correct polarity. This is not meant to be an engineering analysis or to account for IR drop considerations. This may include a comparison to historical data at that location. If readings are outside desired range or are erratic or floating, implement mitigation measures per operator's procedures.
6	Document installation as required by operator's procedures.	Documentation is necessary to maintain record of installed anode locations.